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DATE July 1965

CENTRAL INTELLIGENCE AGENCY
PHOTOGRAPHIC INTELLIGENCE DIVISION
PHOTOGRAPHIC INTELLIGENCE REPORT

LIAO-YANG AMMUNITION/ARMAMENTS PLANT 375
LIAO-YANG, CHINA
(LIAO-YANG SUBARSENAL SHEN-YANG 90TH)

CIA/PIR-65004



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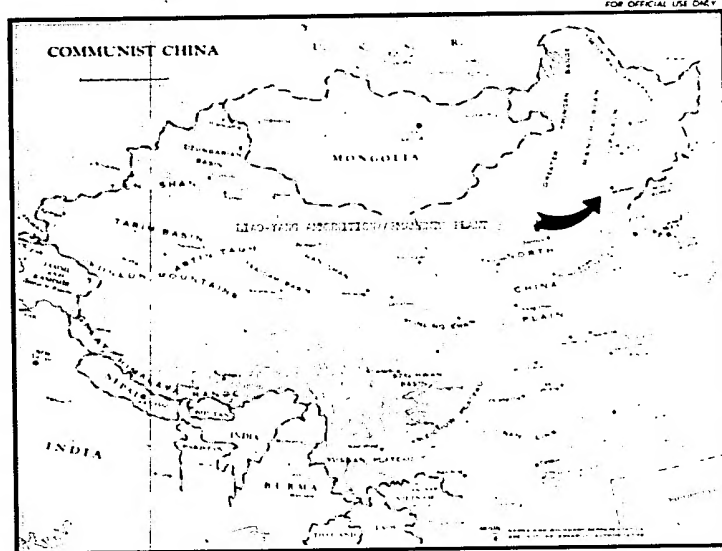
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PIR - 65004
FIGURE 1

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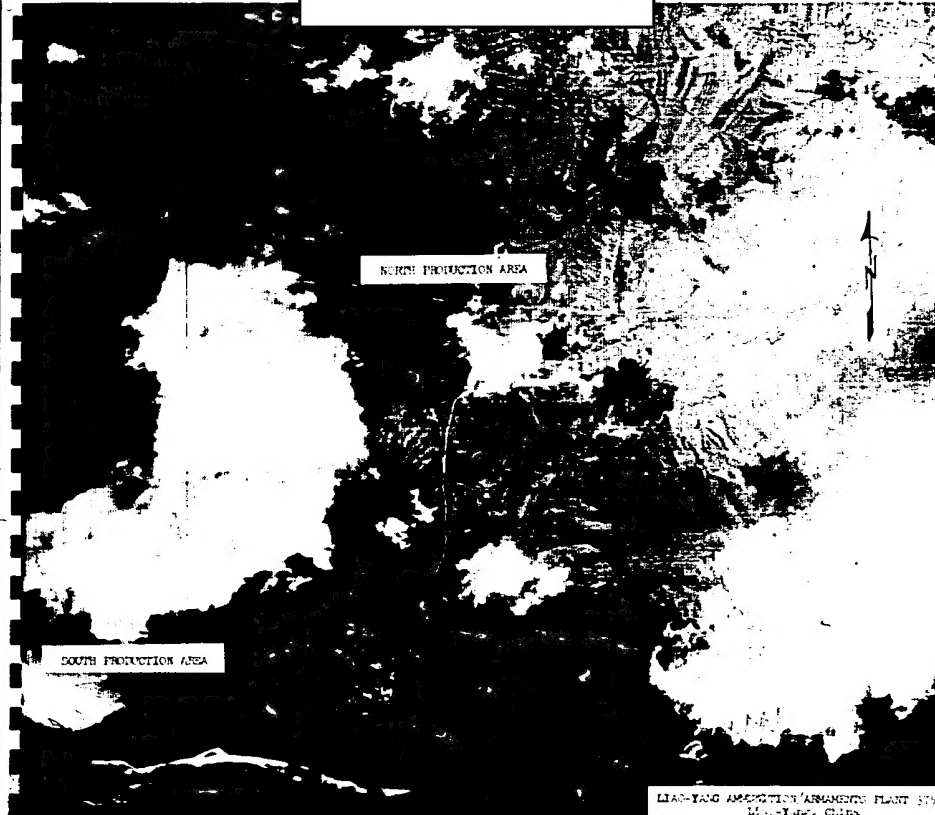
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FIGURE



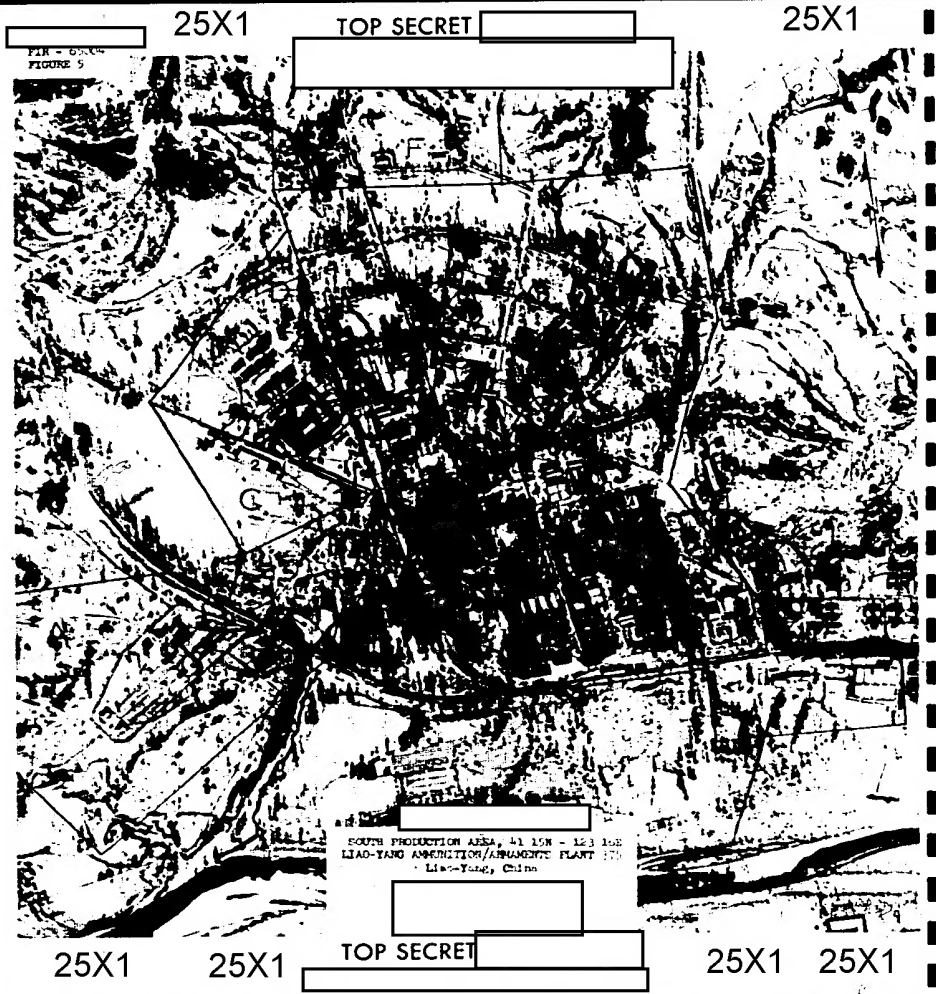
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LIAO-YANG AMMUNITION (ARMAMENTS) PLANT SITE
LIAO-YANG, CHINA
31 10N - 123 17E

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FIGURE



NORTH PRODUCTION AREA, 41 17N - 123 17E
LIAO-YANG ASSOCIATION/ARMAMENT PLANT 100
Liao-Yang, China

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FIGURE 5



WEST STORAGE AREA, 41 16N - 123 15E
LIAO-YANG AMMUNITION/ARMAMENTS PLANT 375
Liao-Yang, China

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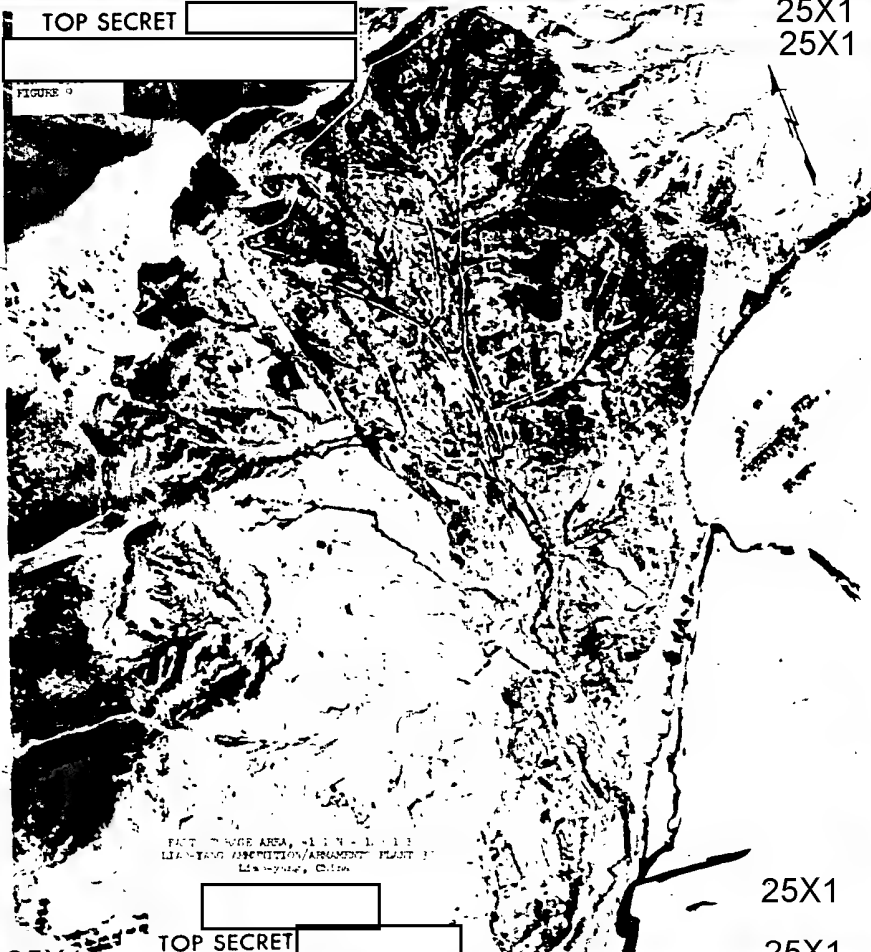
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FIGURE 9



PAINTED WOOD AREA, 1:100,000
LIAO-YANG DISSEMINATION/ARGUMENT, PLANT 1
Liaoyang, China

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LIAO-YANG AMMUNITION/ARMAMENTS
PLANT 375, LIAO-YANG, CHINA
(LIAO-YANG SUBARSENAL SHEN-YANG 90th)

The Liao-yang Ammunition/Armaments Plant 375 (Liao-yang Subarsenal Shen-yang 90th) consists of five principal manufacturing, test and storage sections that occupy an area of approximately 11 square nautical miles. The approximate center of the complex is located at geographic coordinates 41 16N - 123 17E, Figure 2.

The five main sections that make up Plant 375 are, (1) South Production Area including the shell testing and possible tactical rocket test ranges immediately to the SW of the South Production Area, (2) The North Production Area, (3) The Southeast Production Area, (4) The West Storage Area, and (5) The East Storage Area; all of which are identified on Figure 3.

The following sections of this report will discuss each of the enumerated areas in as much detail as possible. Plant expansion and activity levels will be discussed in the concluding paragraphs of the report.

Each of the five plant elements previously mentioned is separately secured by wire fencing and all of the areas except the test ranges have rail spurs. Water for the chemical processing facilities and steam plants is apparently supplied by a series of canals that tap the streams flowing through the area.

South Production Area, Figure 5

The facilities in this area cover approximately 1,000 acres and encompass the following elements (Letter designations keyed to Figure 5)

Area A: Two conventional shell testing ranges (No. 1) constitute the principal facility in this area. An additional single position test range (No. 2) of considerably greater length has been built. This range may have been designed to test small tactical-type rockets. A third facility (No. 3) is currently under construction in the area. It consists of two structures one of which is an irregularly shaped building which is apparently connected to a large, rectangular structure being erected in a deep excavation. The function of these facilities is obscure but there is a remote possibility that they will constitute some sort of a rocket motor or propellant testing facility when completed.

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Area B: This area contains several nondescript buildings and three revetted munitions storage facilities. It is separately secured and is connected by road to the adjacent test ranges. It is used to store and possible assemble and instrument the munitions to be tested.

Area C: This area contains an apparent steam plant (No. 1) a large, rail served building with a high section at one end (No. 2), a water tower and a long low structure, possibly U/C that somewhat resembles a small coke oven, No. 3. Snow covered bulk raw material is in evidence adjacent to the probable boiler house at the east end of the area and three piles of coal can be seen near the west end adjacent to the long low structure previously mentioned. These facilities, together with those in Area D suggest the possibility that petrochemicals such as toluene and naphtha may be produced by the destructive distillation of coal.

Area D: This area contains six major structures interconnected by steam lines and piping, with the three largest structures further linked by large diameter piping such as is used to convey gaseous products. In addition, there are three boiler houses and numerous miscellaneous buildings. A small possible nitric acid plant (No. 1) is located near the center of the boundary between Areas C and D. Beyond the fact that chemical processing requiring great quantities of heat/steam and related to the manufacture of explosives is carried out in this area, no definitive indicators were observed. Nitramon manufacture is a possibility.

Area E: The following facilities are found in this area: Three boiler houses, a large rail-served structure (No. 1) surrounded by several processing buildings, a tank farm containing 4 large and 4 small vertical tanks adjacent to a group of five probable chemical processing buildings (No. 2), three similar ventilated buildings having three associated free-standing stacks (No. 3), and two large complex structures adjacent to three large vertical tanks, (No. 4). Additionally, there are five large buildings, one of which is connected by overhead pipeline to a building in group No. 2, several small structures and two other buildings with associated free-standing stacks. The presence of numerous stacks, the large tanks and the pipeline suggest that the products of Area D may be refined and possibly separated into various fractions in the southern part of this area. The group of facilities surrounding No. 1 may produce nitrocellulose and the group labelled No. 4 constitute a possible sulphuric acid plant.

Area F: There are six revetted and several unrevetted structures in this area. The revetted buildings are probably temporary storage and/or final processing facilities for the explosives produced in Area G.

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Area G: This area contains nitrating facilities for the production of high explosive. The five buildings and very large dome topped tank, (No. 1), may constitute a water treatment facility although no settling ponds are evident. Nos. 2 and 3 are large, complex, heavily revetted nitrating facilities while most of the remaining buildings are used for the final processing of the explosive produced in the nitrators. There is a boiler house near the center of the area. Picric acid is a possible product of the facilities in this area.

Area H: This area is primarily a complex of fabrication facilities with a large amount of warehousing, several shop buildings and numerous small buildings. The facilities suggest the manufacture of munitions related hardware such as shell casings, cartridge cases, mortar shells, land mines and the like. Two large buildings, Nos. 1 and 2, appear to be forge/foundry type structures.

Area I: This area is occupied largely by housing and administration facilities, the total extent of which can be seen on Figure 3.

Area J: This area is occupied by a large quantity of bulk raw material, probably mostly, if not all, coal (No. 3), a large warehouse-type building adjacent to a processing structure of some sort (No. 2) and a linked pair of silos with an elevator shaft (No. 1). This limited photographic evidence suggests that the coal is used as a raw material rather than just fuel and that it may be processed in the area with the possibility that the processing buildings houses electric furnaces for the production of calcium carbide which is the intermediate from which the common modern propellant nitroguanidine is derived. It is also possible that this area is not functionally related to Plant 375.

North Production Area, Figure 6

The North Production Area consists of approximately 900 acres and includes the following principal elements (Letter designations keyed to Figure 6):

Area A: There are eight large U-shaped revetments in this area. Five are unoccupied; the remaining three contain small, ordinary buildings. It appears to be an abandoned high explosives manufacturing facility.

Area B: There are seven complex buildings enclosed by elaborate revetments (No. 1), plus five small rectangular revetted probable storage structures (No. 2), and a boiler house (No. 3). The arrangement of the seven principal buildings suggests two high explosive production lines but the observed facilities could accommodate munitions loading functions. Buried steamlines emanating from the boiler house are probably connected to six of the seven complex revetted buildings.

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Area C: There are more than 30 buildings of diverse shapes and sizes distributed within the loop road at the east end of this area. Nearly all of these structures are partially or completely revetted, or set in recesses cut into the hillside. A steam plant is located near the center of this section. Three storage buildings situated in cut-backs are located in the SE corner of the area. All of these facilities are probably associated with (1) munitions loading functions and (2) processing of propellants, possibly double-base. Immediately west of the section previously described there are two small complexes (Nos. 2 and 3) which together may constitute a nitrocellulose production facility. If such is the case, the buildings at No. 2 are engaged in the preparation of the raw material and the nitrating is carried out in the facilities at No. 3. Both groups of structures have steam lines coming from the boiler house at No. 5. A large vertical tank and numerous small tanks or drums are located adjacent to the possible nitrating facility. Four heavily revetted structures (No. 4), at least one of which is probably a processing building, are located immediately south of the possible cellulose preparation and nitration facilities. Although the facilities are atypical, they constitute the best candidate for the production of nitrocellulose at Plant 375. This, together with the nitroglycerine probably made in Area F, would provide a double-base propellant capability. A large building with a high center section (No. 6) and several miscellaneous structures are also present in the area.

Area D: This area contains two complex buildings, heavily revetted and served by steamlines, (Nos. 2 and 3). These facilities are similar to those in Area B and probably have the same function. There is a building with 10 pipe vents through the roof north of Building 3 and apparently connected to it by a steamline. There is also a steam plant (No. 1) and a group of related structures, No. 4. The group of facilities numbered four consists of seven medium to large buildings, one very long with a high center section, one with 8-10 pipevents through the roof, two with complex floor plans, one partially revetted and two nondescript structures. There are, in addition, four heavily revetted probable magazines and several small miscellaneous buildings. The road pattern linking these various structures suggests that they are functionally related. Munitions loading appears to be the most likely function but the manufacture of specialized high explosives in some of the facilities is possible.

Area E: The main item of interest in this area is a large facility (No. 1) that resembles a power plant but apparently processes large quantities of bulk materials, utilizing a considerable amount of heat. The main building is L-shaped with one leg of the L being a single story structure and the other being a multi-story, two level structure with a large longitudinal monitor. This building is connected to a smaller one by two conveyors, one up, one down. The smaller building is connected by a single conveyor to a third still smaller structure which is at the terminus of a rail spur along which large quantities of snow-covered raw materials are piled. There is a large tank on the north side of the facility and a large free standing stack serving two furnaces/boilers/retorts

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that are apparently part of the main building. The bulk raw material processed in this facility is at least partly coal; lime or limestone may be the other part. If this is the case, calcium carbide/cyanamide is a possible product which in turn could be used to make guanidine nitrate and ultimately nitroguanidine. In addition there are three rail spurs; several small buildings and numerous warehouses.

The facilities labeled No. 2 are outside of the present security fence line but are tied to the possible calcium carbide/cyanamide plant by overhead pipelines. This group consists of a large, monitor-roofed building with two large incomplete tanks and a tall cylindrical structure that is located near the west end of the building as is a partially completed probable forced draft cooling unit. Two warehouses with a rail spur between them are located south of the main building and are connected to it by a conveyor. The purpose of these facilities is obscure and it may not be functionally related to Plant 375. It could turn out to be an ammonis/ammonium nitrate plant when completed.

Area F: This area contains eight very heavily revetted facilities with associated support structures which make up two nitrating lines for the manufacture of high explosive, probably nitroglycerine but possibly TNT, RDX, PETN, etc.

Area G: This area contains numerous revetted buildings, some of which probably constitute manufacturing facilities for detonator/initiator-type explosives (No. 3), a possible melt-loading facility (No. 1), a possible gelatin dynamite manufacturing section (No. 2) and probable loading facilities in the rest of the area.

Southeast Production Area, Figure 7

The principal feature of this secured area of approximately 35 acres is the set of heavily revetted nitrating facilities, (No. 6). In addition, there are two boiler houses, (Nos. 4 and 7), a series of buildings (No. 5) with several probable small tanks immediately south of the buildings. A separately secured area (No. 3) west of the production area contains one large above-ground tank, two possible small tanks and a small building. A large group of warehouses under construction (No. 1) and the south end of the East Storage Area (No. 2) are also visible on Figure 7. There are no definite indicators of the type of explosives made in this area but either TNT or gelatin dynamite are good possibilities. A rail spur and a turning wye, both apparently abandoned, are present in the area.

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West Storage Area Figure 8

This secured explosives/munitions storage area occupies an area of approximately 100 acres. It contains 15 revetted storage buildings, several probable underground storage facilities, three or more earth-covered igloo-type magazines set into a hillside at the north end of the area and two possible large buried tanks.

East Storage Area, Figure 9

This large, secured, rail-served explosives/munitions storage facility occupies an area of approximately 1,100 acres. It contains 17 storage buildings that are either revetted or set in recesses cut into the sides of ridges; one large, square, earth-covered structure, eight warehouse-type buildings; three to six underground probable storage facilities and three or four miscellaneous structures including a guardhouse located at the entrance to the compound.

Expansion at Plant 375

The quality of the earliest available photography [REDACTED] Figure 4, does not permit a detailed analysis of plant expansion since that time. However, it can be seen that the South Production Area was present in approximately its present form [REDACTED] and that the main elements of the North Production Area were also present. The Storage Areas and the Southeast Production Area are not discernible on the [REDACTED] photography but it seems probable that they existed, at least to some extent, at that time.

Changes that have occurred at Plant 375 [REDACTED] have been restricted to the construction of a relatively small number of non-diagnostic buildings and a few tanks in the various plant areas. The only notable change that suggests possible new products or functions for the plant has been in the test area where an additional test range has been constructed, a new facility having two connected structures is under construction, and two additional buildings have been added to the complex at the east end of the twin shell testing ranges.

Level of Activity at Plant 375

It is next to impossible to judge the level of activity at Plant 375 from the available photography. The [REDACTED] coverage yields no evidence one way or the other. The [REDACTED] coverage reveals a considerable quantity of rolling stock

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scattered along the several plant RR spurs, including ordinary flat cars, box cars and tank cars. The same coverage shows a small percentage of the numerous stacks in the plant emitting visible vapors. The [REDACTED] coverage reveals about the same percentage of smoking stacks and only a few rail cars [REDACTED]

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[REDACTED] photographic coverages indicate that the North and South Production Areas are operating and continued though small scale construction activity suggests either some expansion of activities or change in products, possibly both. The SE Production Area shows evidence of very little activity on both

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the [REDACTED] photography although streets cleared of snow are visible on the latter coverage and indicates some use of the facilities.

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REFERENCES

25X1

MAPS OR CHARTS

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1st Edition, Apr 61, Scale 1:50,000 (SECRET

25X1

DIA. US Air Target Chart, Series 200, Sheet SO 290-16HL,
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25X1

DOCUMENTS

NPIC/R-222/63, Liao-yang Subarsenal, China
Aug. 1963, (TOP SECRET

25X1

REQUIREMENT

CIA. C-RR5-82,647

CIA/IAD PROJECT

30777-5

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